Texas Cleanup Program

The Texas Commission on Environmental Quality (TCEQ) oversees the investigation and cleanup of hazardous and nonhazardous pollutants released into the environment. Cleanup is conducted using a risk-based approach outlined in the Texas Risk Reduction Program (TRRP) rule (30 TAC Chapter 350). TRRP provides consistent application of corrective actions with reasonable objectives that protect human health and the environment and preserve the productive use of land. Major components of the rule include the requirements for assessment, exposure pathways evaluation, development of protective concentration levels (PCLs), property owner and public notice, remedy selection standards, and institutional controls.

Subchapter D of the TRRP rule outlines the process by which PCL cleanup levels are calculated. PCLs are risk-based concentration limits for contaminants in the affected environmental media (*e.g.*, soil, groundwater, etc.) that are protective of human health and the environment. The rule describes a three-tiered methodology to calculate the PCLs. The tiers represent increasing levels of evaluation where site-specific information can be used in the process, although Tier 1 default PCLs are used in most cases. TRRP eliminates ambiguity from risk and hazard criteria provisions by adopting clear risk levels.

TRRP also specifies the exposure pathways that must be evaluated (*e.g.*, groundwater ingestion, soil exposure, and inhalation exposure) and how to determine when it can be assumed that someone could have a reasonable potential to come into contact with the contamination. If a pollutant exceeds its PCL at any point of exposure, a response action is required. Cleanup is not complete until all pollutants are within their PCLs at the points of exposure (or institutional controls are implemented to prevent exposure). The Tier 1 default PCLs are published on the TCEQ's website (https://www.tceq.texas.gov/remediation/trrp/trrppcls.html) and are updated regularly as new science becomes available.

Can you compare TCEQ PCLs to the EPA Superfund Chemical Data Matrix (SCDM) benchmarks and Regional Screening Levels (RSLs)?

Unlike TCEQ PCLs, the federal SCDM benchmarks are not cleanup values. The SCDM is a source of *screening* concentration benchmarks. The EPA and states use the SCDM to evaluate potential National Priorities List (also known as Superfund) sites using the Hazard Ranking System during the site screening stage. EPA outlines the proper application of the SCDM on their webpage (https://www.epa.gov/superfund/superfund-chemical-data-matrix-scdm). Appropriate cleanup values are determined only after a site has been screened.

Similarly, EPA's RSLs are used for *screening* of site sampling results on a region-by-region basis, but are not themselves cleanup values. Rather, RSLs are merely used as starting points for EPA to determine site-specific cleanup values, which are often much higher. For example, EPA can increase an RSL for a cancer-causing chemical by up to 100-fold in calculating a specific cleanup value, based on site-specific considerations.

Thus, EPA *screening values*, such as SCDM benchmarks and RSLs, are not national soil or groundwater *cleanup standards*. Consequently, comparisons of Texas's PCLs (cleanup values) to EPA's SCDM or RSL (screening values) are inappropriate.

How do EPA, TCEQ, and other state cleanup values differ?

It is common for human health risk-based cleanup values to differ among agency remediation programs. These differences are due largely to different parameters in the cleanup value equations, such as the hypothetical exposure parameter values, the critical receptor, and/or toxicity factors, etc. EPA determines all of its cleanup values on a site-by-site basis, while Texas uses a hybrid of uniform default values that apply consistently to all sites (Tier 1 generic cleanup values, which are used most frequently) and site-by-site determination (Tier 2 and 3 cleanup values, which are used infrequently). As a result, TCEQ's cleanup values are sometimes higher and sometimes lower than EPA's cleanup values.

In a general sense, the following points are useful to understanding how TCEQ and EPA cleanup values might compare:

- Like EPA, the TCEQ uses a risk-based program to protect Texans from the potential cancer and non-cancer health effects that might occur due to contact with contaminated soil, groundwater, and other environmental media. The TCEQ does this by remediating contamination at sites to concentrations that are at or below health-protective PCLs calculated for soil, groundwater, or any other impacted media.
    - The methods for calculating PCLs are designed to provide conservative, health-protective concentrations. For example, residential surface soil PCLs assume a fairly intense and persistent level of daily contact with soil for both adults and children. It also considers that people may be simultaneously exposed to multiple long-term exposure pathways. These include incidental ingestion of soil, dermal contact, inhalation of vapor/particulate emanating from soil, and ingestion of homegrown produce.
    - As a practice, TCEQ toxicology staff annually review new and revised toxicity factors for chemicals based on new dose-response assessments and developments in the scientific literature. Changes in toxicity factors may result in PCL calculations being higher or lower based on improved understanding of a specific chemical's toxicity.

- Both the EPA and TCEQ commonly use a hazard quotient of 1 (which is the concentration of a chemical where exposure would not be expected to cause any health effects) to calculate actual cleanup values for individual chemicals with noncarcinogenic effects.
- For chemicals that can cause cancer, remediation programs calculate a theoretical excess cancer risk from chronic (i.e., long-term) exposure to determine appropriate cleanup values.
    - The EPA uses a *variable* theoretical excess cancer risk of 1-in-10,000 to 1-in-1,000,000 to assign cleanup values.
    - The TCEQ, by contrast, uses a *fixed* excess risk level of 1-in-100,000 to determine cleanup values (PCLs).
    - To put this risk level into perspective:
        - A person's background lifetime risk for developing cancer is around 33 percent. A lifetime theoretical excess cancer risk of 1-in-100,000 would theoretically increase the chances of a person developing cancer from that actual background risk to 33.001 percent for a reasonable maximum estimate.
        - Consider, for example, benzo-a-pyrene (BaP), which results from certain combustion processes. The theoretical excess risk level of 1-in-100,000 for the reasonable maximum exposure residential scenario assumed by TRRP appears to be well within the range of risk due to everyday exposure to BaP in the diet (*e.g.*, BaP is found in grilled meats, among many other foods).
- In calculating soil cleanup values, the TCEQ assumes that residents can directly come into contact with any contaminants in soils as deep as 15 feet and workers can have contact with soils as deep as five feet. The EPA generally assumes human (e.g., resident, worker) contact with soils up to two feet deep.
- The EPA allows a less conservative trespasser-exposure scenario to determine the acceptability of risk at some sites. In contrast, the TCEQ TRRP exposure scenarios are based on just two prescribed land uses (*i.e.*, residential and commercial/industrial).

It is important not to confuse screening values with cleanup values. It is equally important to understand that while different agencies use slightly different approaches to assign cleanup values for a given pollutant and site, these differences do not mean that one approach is better or more protective. In all cases, Texas's cleanup values—whether they are higher or lower than EPA's—are the result of sound science and a uniform method to assess risk at each site using conservative assumptions to be protective of human health and the environment.

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